We have no reason to believe that ovarian cysts will retrogress after pregnancy, as may be the case with fibroids. The treatment of ovarian cyst is surgical. The complications of cysts with twisted pedicle during pregnancy, labor or the puerperium, and the complication of the rupture of a cyst may be unpleasant, yet my experience leads me to believe that, where the patient is in close touch with a trained obstetrician and satisfactory hospital facilities, one may be justified at times in following a conservative course but must be prepared for emergencies which can arise.

I am satisfied that had the ovarian cysts in all of the patients enumerated above been removed promptly when first detected or at the fourth month, we would have lost more of the pregnancies by miscarriage.

In the interest of completeness one would like Doctor Lynch to have mentioned the cases of pregnancy complicated by large cyst in the broad ligament. These may be of sufficient size to prevent delivery through the usual channel. Operation to remove the cyst during pregnancy could be best done at the sacrifice of the uterus and pregnancy. Although the delivery is necessarily done at term by cesarean section, the removal of the cyst at the same time is very difficult and dangerous because of the marked vascularity of the pelvic structures and can be accomplished with less risk at a later operation.

SURGICAL LESIONS OF THE BILE DUCTS AND THE GALL-BLADDER: CERTAIN PRINCIPLES IN THEIR TREATMENT*

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IN considering the surgical treatment of lesions of the biliary passages, I shall deal only with the most important features concerned in: (1) indications for operation, (2) significance of jaundice, and (3) associated lesions of the liver and pancreas.

INDICATIONS FOR OPERATION

It will not be disputed that patients with lesions of the gall-bladder that produce pain severe enough to require morphin do not afford a problem for the clinician, particularly if the colic appears at frequent intervals. The necessity and value of cholecystectomy or cholecystostomy in these cases is as well appreciated by laymen as by the profession. There is a group of patients, however, usually women, who have stones in the gall-bladder, without characteristic symptoms, and they are accidentally discovered by the roentgenologic examination, in the course of a general examination, or at operation for another trouble. Gall-stones of this type have been given the erroneous name of "silent gall-stones," silent because they have existed unknown to the patients, yet far from silent from the standpoint of inactivity or potential harmful effects.

Clinical and experimental evidence is overwhelmingly in favor of the hypothesis that the formation of stones in the gall-bladder occurs only in the presence of infection. Such infection in the walls of the gall-bladder may spread through its lymphatic structures to the liver, examples of which are evident hepatitis in the portion of the liver which overlies the diseased gall-bladder. Extension of the infection in the walls of the gall-bladder, through its lymphatic structures to the pancreas, is not uncommon, clinical evidence of which is the indurated, nodular feeling of the pancreas on palpation. More exaggerated effects on liver and pancreas, secondary to infection in the walls of the gall-bladder, are illustrated by a group of patients operated on for diseases of the biliary passages who were jaundiced at the time of operation. Stones, strictures or tumors were not present to obstruct the common or hepatic ducts. In such cases cholecystectomy and drainage of the common bile duct relieves the jaundice and restores the patient to health.

In a few cases in which examination unexpectedly revealed stones in the gall-bladder and cholecystectomy was advised, the patients wished to defer operation. They have returned sometimes within a comparatively short time, complaining of increasing dyspepsia or of biliary colic. In some of these cases it has been found at operation that a stone had been impacted in the cystic duct with distention of the gall-bladder and empyema. The stones apparently had left the gall-bladder in the course of an attack of colic and had entered the cystic duct or had passed through it into the common bile duct. Delay in removing the diseased gall-bladder and the gall-stones increased the extent of the lesion as well as the risk of operation, both of which would have been avoided by operation when the disease was confined to the gall-bladder.

There is a group of cases of disease of the gall-bladder, with or without stones, in which pylorospasm or other disturbances of motility of the gastro-intestinal tract occur secondarily, producing in some instances rather characteristic dyspepsia; in others bizarre features. The distressing feeling of fullness in the epigastrium noted soon after eating, and its aggravation following the eating of food such as raw apples, fats, cabbage, and particularly fried foods, is almost pathognomonic of cholecystitis. In this type of case, in which the roentgenogram has shown the gall-bladder to be incapable of filling and emptying normally, I am inclined to advise operation, particularly if the dyspepsia has been sufficiently continuous or disturbing to interfere with the patient's health. In such cases accurate determination of the site of the infection is of the utmost importance and the necessity of operation must be accurately determined, else failure completely to relieve patients may lead them to discredit cholecystectomy. The so-called failures to cure following cholecystectomy may occur in cases of this type, and yet, in properly chosen cases, as excellent results may be obtained as in cases of biliary colic. The value of operative procedures is further emphasized by the fact that they lead to exploration of other abdominal viscera. A demonstrable, definitely subacute, or even

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an acute infection sometimes has been discovered to exist in the appendix. I recall a case of mild dyspepsia in which the symptoms did not seem to warrant cholecystectomy. The day following examination an acute exacerbation developed of what for the first time appeared to be acute appendicitis rather than cholecystitis.

SIGNIFICANCE OF JAUNDICE

In considering the significance of jaundice, I shall refer only to the obstructive type. If jaundice is obstructive it should be determined whether the obstruction is within the liver or in the extrahepatic bile passages. Probably the simplest method of differentiation can best be expressed as follows:

In a case of painless jaundice in which the amount of bile in stools or in duodenal content is normal, and the gall-bladder is not palpable, the possibilities are that the obstruction is intrahepatic. Obstructive jaundice following attacks of biliary colic, or accompanied by chills and fever, or painless jaundice with absence of bile in the stools and a palpable gall-bladder, are most likely to be due to an obstructing lesion of the extrahepatic bile ducts. From the standpoint of differential diagnosis of lesions obstructing the common and hepatic bile ducts, it might be emphasized that biliary colic followed by jaundice, with or without chills and fever, is indicative of intermittent obstruction to the passage of bile from the liver to the intestine. This is true whether the cause of the obstruction is stone in the common or hepatic bile ducts, tumor in the head of the pancreas, or stricture. Furthermore, painless obstructive jaundice may occur from the same causes. It has been said that no one is infallible in making a differential diagnosis of obstructive jaundice. The diagnosis is always difficult and the chance of a life saved is so important that no matter how positive the evidence of a malignant lesion may be, exploratory operation is advisable if the patient's general condition will permit such a procedure with reasonable safety.

A period of observation of three or four days in cases of obstructive jaundice enables one to determine whether the jaundice is fluctuating. This can be determined best by the van den Bergh test of the amount of bile pigment in the blood serum. If the degree of jaundice is receding, it is best to delay operation until the amount of bile pigment in the blood serum reaches a minimal level. On the other hand, should the jaundice be increasing, the advantages of immediate exploration must be weighed carefully against the increased risk of operation. In this period of observation the patient can be prepared for operation by administration of a sufficient quantity of fluids, usually 3000 cubic centimeters daily, and an abundance of carbohydrates, to compensate for the disordered function of the liver; the administration of agents that increase blood coagulation, such as calcium chlorid intravenously or transfusions of blood, may compensate for the effect of bile in the blood. In general, if the concentration of serum bilirubin is greater than 15 milligrams in each 100 cubic centimeters, the parenchyma of the liver may have been considerably injured. I have observed patients of this type who failed to recover, owing to insufficiency of the liver after the simple removal of stones obstructing the common bile duct, a further argument in favor of early operation in cases of cholelithiasis.

In dealing with stones in the common bile duct, it is absolutely essential that all stones be removed, else obstruction will recur in which event increased jaundice or uncontrollable bleeding, with terminal hepatic and renal insufficiency may prevent recovery.

In cases of stricture of the common bile duct in which there is sufficient normal duct above the stricture to permit anastomosis to an opening in the duodenum, a union of mucous membrane to mucous membrane should be secured; this is by far the best method of restoring continuity between the biliary and the intestinal tracts. There are scores of records in The Mayo Clinic in which this operation has been carried out and the patients have lived without evidence of obstruction for a sufficient number of years to prove that the obstruction has been satisfactorily and permanently relieved.

There are cases of complete stricture of the common and hepatic bile ducts in which the chances of reëstablishment of passage of bile from the liver into the intestine are thought to be almost hopeless. In such cases, within the last seven or eight years, relief has been afforded by establishing external discharge of bile and later restoring biliary-intestinal continuity by coning out the established external biliary fistula and transplanting it into the stomach or duodenum. In the early part of 1931 I reported five such cases in which I had operated and which I had studied for several years. The results were surprisingly good.

ASSOCIATED LESIONS OF THE LIVER AND PANCREAS

In tumors of the head of the pancreas in which obstruction of the common bile duct is produced, diagnosis is made immediately on opening the abdomen; the gall-bladder and the common bile duct are distended, but the walls are normal in color and thickness. In the head of the pancreas is felt an indurated, irregular, almost stony mass, typical of a carcinoma of the pancreas. In such cases anastomosis of the gall-bladder to the stomach or duodenum, besides prolonging the lives of patients, affords relief of the jaundice and of the troublesome itching of which most patients complain bitterly. I have observed a few patients with this type of obstruction who have lived comfortably and have carried on their work for more than three years. It must not be forgotten that in some instances the clinical diagnosis of a malignant lesion, with tumor in the head of the pancreas, may be erroneous; the enlargement of the

obstruction at the head of the pancreas may be the result of inflammatory rather than of malignant change. A permanent good result, with relief of the obstruction, can be expected in these cases. The possibility of error in the clinical diagnosis of carcinoma of the head of the pancreas, averages, I believe, about 15 per cent; thus it would seem best not to commit oneself hurriedly to a diagnosis of a malignant lesion. A diagnosis can be made only by removal of a specimen from the pancreas; however, this is done only in exceptional cases because of the danger of uncontrollable postoperative bleeding. On the other hand, if patients live longer than five years following cholecystenterostomy, it may be assumed that the obstructive lesion was inflammatory.

I have mentioned briefly a group of cases in which jaundice may accompany cholecystitis, without evident cause for the obstruction in the common or hepatic ducts or in the pancreas. Usually the infection in the walls of the gall-bladder, which may be slight, is the result of obstruction within the liver or in the pancreatic portion of the common bile duct, due to extension of the infection from the gall-bladder to these structures. In other cases the jaundice is due to induration from infection extending from the gall-bladder, down through the walls of the cystic duct, into the walls of the common bile duct; the burden of proof that a stone or stones is not the cause of the obstruction rests squarely on the surgeon's shoulders. In these cases the common bile duct must be opened and explored thoroughly with scoops for stones. The surgeon should not be satisfied until he has ascertained that the exploring scoop slips readily through the lower end of the common bile duct into the duodenum.

POSTOPERATIVE CARE

The significance of the care of patients following operation for lesions of the biliary tract, especially patients who have jaundice, cannot be overemphasized. Sufficient fluid must be maintained in the body. At times the intravenous injection of glucose, 10 per cent in physiologic sodium chlorid solution, is of a decided advantage. If oozing takes place, intravenous injections of solution of calcium chlorid or transfusion of blood, repeated if necessary, will often prove to be life-saving measures. Should the patient bleed subsequent to operation, I have never hesitated to reopen the incision to determine the site of the bleeding, and to control it, regardless of the condition of the patient. On two occasions (one of which occurred within the last six weeks) such procedures, I am certain, made it possible for the patients to recover. A study of the concentration of bile in the blood, of the coagulability of the blood, of the function of the kidneys subsequent to operation, afford valuable information of the patient's progress; such study is especially important if the patient's convalescence is troubled, for it affords indications of the site of the trouble and assists in determining the proper methods directly to overcome it.

The Mayo Clinic.

CARDIOSPASM*

By JOHN HUNT SHEPHARD, M. D.
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DISCUSSION *by Gunther Nagel, M. D., San Francisco; F. A. Speik, M. D., Los Angeles.*

IN 1906 Dr. H. S. Plummer, in a paper reporting forty cases of cardiospasm, read before the Minnesota State Medical Association, said: "So little attention has been paid the subject by American clinicians that a brief general consideration seems desirable."

Since that paper was so complete, any subsequent writings are only a restatement of the findings therein contained, which probably explains why so few papers have been presented upon this subject. My only excuse for presenting this paper is to refresh your memory, for I am confident that many of these cases are being overlooked.

Though the condition is most distressing, easy to diagnose, successfully and almost magically relieved, it is not receiving the attention its frequency entitles it to.

Vinson reports 415 cases showing definite roentgenologic evidence of obstruction to the barium meal, seen at the Mayo Clinic from January 1908 to June 1923. This is approximately one out of every eleven hundred admissions. Since the vast majority of their patients had recent medical advice elsewhere and only rarely had the cardiospasm been recognized, we must conclude that proper consideration has not been given to this condition.

In 1874 Von Ziemssen and Zenker collected the first series of cases of cardiospasm from autopsy records and considered them to be idiopathic dilatation of the esophagus. Mikulicz in 1882 was the first to attribute this dilatation to spasm of the cardia.

ETIOLOGY

The etiology is unknown. Though the intermittent spasmodic closure of the cardia suggests a nervous origin, definite evidence of neurosis is usually absent. Recent advances in our knowledge of the sympathetic nervous system and its control over nonstriated muscle fibers, permits one to speculate that perhaps the sympathetic nervous system may have something to do with the causation of cardiospasm and megacolon, and ultimately, on this same basis, we may transfer asthma to the surgeon's field.

The symptoms of cardiospasm are often pathognomonic. Moynihan once said duodenal ulcer can usually be diagnosed over the telephone. So cardiospasm is usually diagnosed from the history, though the x-ray must confirm or deny the diagnosis.

THREE STAGES IN THE DEVELOPMENT OF CARDIOSPASM

There are three stages in the progress of the development, or we may say three degrees, of cardiospasm.

* Read before the General Surgery Section of the California Medical Association at the sixtieth annual session, San Francisco, April 27-30, 1931.